ESP BIOLOGY:

SUMMER LAB ASSIGNMENT

Along with teaching you the big ideas of biology, a major focus of this course is to practice scientific skills. Together this should help prepare you for ESP biology and further study in any of the sciences. This summer assignment will allow you to practice many of these skills, which will hopefully give you a solid foundation that we can strengthen throughout the year. These skills include designing an experiment, collecting data, and drawing conclusions. **In this project you will create a "lab notebook" for a 14-day experiment, while outlining your data and observations.** It is imperative that you complete the assignment because we will write a lab report together during the first week of school on this experiment. ***Failure to complete this assignment can result in you losing points not only on the summer assignment, but on this lab report as well.***

The summer assignment may seem complicated, but as long as you follow the directions you should have no problem…SO READ CAREFULLY 😤

DUE DATE: FIRST DAY OF CLASS! (please have it stapled ready to turn in)

If you need help or have questions about the assignment, email me at:

aferrari@rivercityscience.org

Background: In this experiment you will test the following question: **How does the amount of water affect plant growth?** The data that you collect will be recorded with words, pictures that you will take with a camera,

and measurements that you will organize into a table.

Creating the Lab Notebook: Your lab notebook will be a collection of ALL your ***HANDWRITTEN***

observations and measurements during the 14-day experiment. Each day will have its own page, and then you will organize all your data on a separate page; this comes to a total of 15 pages (stapled together). **Be sure to label the date for each day and include your name on each page!**

Each Lab Notebook Page should have the following:

1. A picture of the 3 plants—**You must be in the picture too!** This should be glued/taped/stapled on a sheet of paper (printer or lined paper is fine).
2. A caption for the picture where you label each plant and include any observations required.

3. Each plant's height measured in centimeters (cm).

Materials: a camera/picture taking device (remember you can always get a disposable one and develop the pictures!), red kidney beans (in a bag not a can!), a ruler, a sharpie, **clear** plastic cups, and potting soil **without moisture** pellets (can find at any hardware/home improvement store).

Procedure for the Experiment: Read very carefully and follow these steps! Remember to record each day in your lab notebook.

Day 1:

1. Put 3 red kidney beans in a clear plastic cup. Pour water into the cup until it is about an inch over the surface of the red beans. **Leave the beans in the water overnight. These will be the fully watered beans.**
2. Put another 3 red kidney beans in a plastic cup. Again, pour water into the cup until it is about an inch over the surface of the beans. **Leave the beans in the water for 1 hour**. **These will be the lightly watered beans.**
3. Put another 3 red kidney beans in a different plastic cup. **Do not add water to these beans. These will be the non-watered beans.**

Take a picture of the beans in the cups with the camera **making sure you are in the picture. Create a caption for the picture and label each cup.**

Day 2:

1. Describe the beans in each of the 3 cups noting any changes in the beans – changes in size, shape, color, texture, etc.

Take a picture of the beans in the cups with the camera **making sure you are in the picture. Create a caption for the picture and label each cup.**

2. Pour out the water from one of the watered beans and place the beans on a napkin. Clean out the cup and put potting soil in the cup until it is about an inch from the top of the cup. Place the beans about an inch below the soil all around the cup. You want them to be up against the plastic sides of the cup so you can watch them through the plastic. Add 0.5oz (1 tablespoon) of water to the soil. Label this cup with the sharpie as the watered cup (W).
3. Repeat step 2 with the other beans in the cup with water, ONLY THIS TIME **DO NOT** ADD THE 0.5oz of WATER AT THE END. Label this cup with the sharpie as the lightly watered cup (LW).
4. Before planting the beans from the non-watered cup, you have to dry out the soil by putting it in a baking pan

in the oven at 200°F for about 30 minutes. Plant the beans from the non-watered cup in the same way as step 2 and 3, BUT DO NOT ADD THE 0.5oz WATER AT THE END. Label this cup with the sharpie as the nonwatered cup (NW).

**Take a picture of the beans in the cups AFTER PLANTING with the camera making sure you are in

the picture. Create a caption for the picture and label each cup.**

Day 3 - Day 14: Follow the steps below that describe watering protocol and data collection.

- **Watering Protocol**
    - Fully watered plants (W): Add 0.5oz (1 tablespoon) of water each day
    - Lightly watered plants (LW): Add 0.5oz (1 tablespoon) every 3 days (Day 5, 8, and 11).
    - Non-watered plants (NW): DON'T ADD ANY WATER!

• **Data Collection**: Continue to take pictures of the 3 beans/plants in each cup every day with you in the picture. Be sure to have a caption and label each cup. In your caption:

- Describe the beans in each of the 3 cups noting any changes in the beans – changes in size, shape, color, texture, etc
- Measure each plant in centimeters (cm) once it emerges from the bean. **Make sure you assign each plant a number (1-3). You must remember these numbers and label them in your notebook each day, as well as record their individual heights in the data table.**

****If you have no growth after 3 or 4 days**, start over OR email me for suggestions – do not come to school and say that your beans did not grow. **You may have an idea about what should happen in the cups– but if it doesn't happen it is not wrong** and y**ou do not have to start over and over** until what you think should happen happens. You record what **<u>does</u>** happen. This does not mean that no growth of any beans in either group is acceptable – if you do not have any growth at all in either group you will need to begin again.**